

1. D (pH would change due loss of HCl + formation  $\text{CO}_2$ )

2. A

3. D

4. B

5. C

6. B

7. C

8. a i) collisions decrease over time

ii) all reactants are used up and the amount of  $\text{N}_2$  produced no longer changes

b i) the rate would increase

ii) frequency of collision increase + collisions have energy  $> E_a$ , far more important since rxns won't happen w/ just collisions alone

iii) rate would go down, having large lumps would decrease the surface area giving less area for collisions to happen

9. a) decrease in reactant concentration over time or an increase in product conc. over time

b) i) collisions are very frequent + the collisions that do happen don't  $E_a$  + incorrect orientation of molecules when they do collide

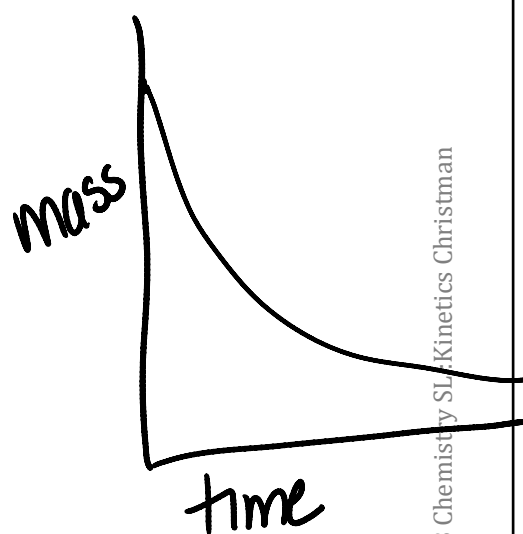
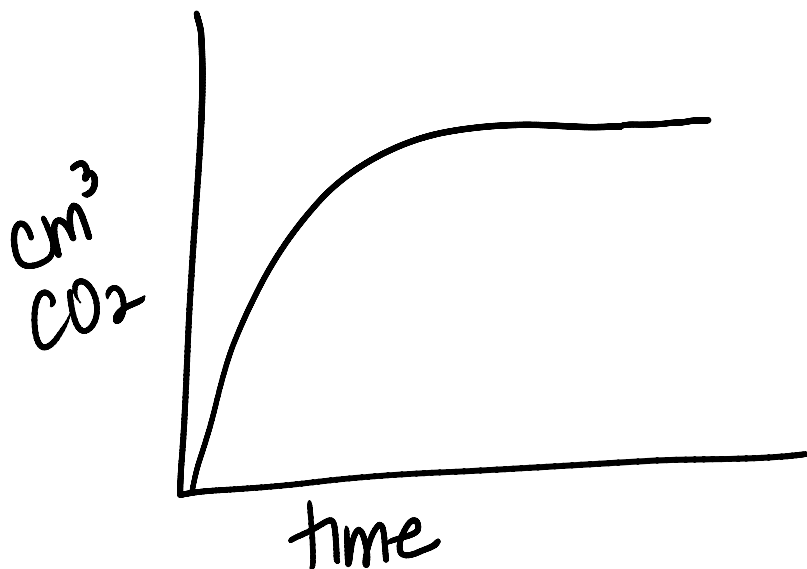
ii) more frequent collisions  
more molecules have  $> E_a$

iii) - increasing pressure (same as  $\uparrow$  conc) for gases  
- add a catalyst

10 a) - correct orientation  
- have  $> E_a$

b) - more frequent collisions  
- increased # of molecules with  $> E_a$

11. a) - increase in formation of  $\text{CO}_2(\text{g})$   
- decrease in mass of products



b. - adding Catalyst - lowers  $E_a$

- increasing surface area of  $MgCO_3$  - increases collision frequency

- increasing conc.  $HCl$  - increases collision frequency

- adding heat - increases collision frequency and high amt of molecules have  $>E_a$

c i) stay the same,  $MgCO_3$  was already in excess in the 1<sup>st</sup> reaction so adding more will have no effect

ii) stays the same since quant. of reactants didn't change, it will just get there faster

## *Unit 7: Book Review*

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